FLUKE®

Instruction Sheet

80PK-2A

Type K Immersion Probe

WARNING

TO AVOID ELECTRICAL SHOCK, DO NOT USE THIS PROBE WHEN VOLTAGES EXCEEDING 24V AC RMS OR 60V DC ARE PRESENT. THE PROBE TIP IS ELECTRICALLY CONNECTED TO THE OUTPUT TERMINALS.

INTRODUCTION

The 80PK-2A Type K Thermocouple Immersion Probe is designed for use in liquids or gels. The probe can also be used as a general purpose temperature probe. The thermocouple junction is protected from tip to handle by an Inconel sheath. The 4-foot cable is terminated with a Type K miniature thermocouple connector with 0.792-mm (0.312-in) pin spacing. The 80PK-2A can be used with any temperature-measuring instrument that is designed to accept Type K thermocouples and has a miniature connector input.

NOTE

The 80PK-2A is not recommended for use in food or beverage preparation.

SPECIFICATIONS

Type: K Standard Grade Ni-Cr vs Ni-Al (Chromel vs Alumel)

Measurement Range: -196°C to 927°C (-320°F to 1700°F)

Accuracy (With respect to ANSI MC96.1-1982 - Standard Limits of Error):

NOTE

All error calculations should be done in °C, then scaled to °F.

RANGE	ACCURACY (% of reading)
-196° C to -110° C (-320° F to -166° F)	±4% (° C)
-110° C to -40° C (-166° F to -40° F)	±4.4° C
-40° C to 275° C (-40° F to 527° F)	±2.2° C
275° C to 927° C (527° F to 1700° F)	±0.75% (° C)

Output: @ 25° C (77° F) = 1.00 mV (reference junction @ 0° C)

Seebeck Coefficient: @ 25° C (77° F) = 40.50 μV/° C

Measurement Time (Time Constant): .75 seconds in 100° C still water at sea level pressure. Complete step change equals 5 time constants (3.75 seconds).

Maximum Voltage: 24V ac rms or 60V dc

Maximum Temperature of Tip: 927° C (1700° F)

Sheath
Material: Inconel 600
Dimensions:
Diameter: 3.175 mm (⅛ in)
Length: 20.32 cm (8 in)

Grounding: Junction welded to sheath

Cable
Length: 1.2 meters (4 ft)
Insulation:
Material: PVC
Maximum Temperature: 105° C (220° F)
Color: Gray

Conductors
Type: K
Size: AWG #24 stranded (7 strands of #32)

Handle
Material: Gray Hytrel
Maximum Temperature: 125° C (257° F)

Connector
Type: Mini-thermocouple connector with .792 mm (0.312 in) pin spacing.
Material: Yellow Hytrel
Maximum Temperature: 125° C (257° F)

Overall Length: 31.75 cm (12.5 in) from probe tip to end of cable strain relief.

Protection: Class 3. Relates solely to insulation and grounding properties defined in IEC 348.

MEASUREMENT CONSIDERATIONS

Instrument Compatibility

The 80PK-2A is compatible with any temperature measuring instrument that accepts Type K thermocouples, has a miniature thermocouple connector, and has cold reference junction compensation. Accuracy of the temperature-measuring instrument must be considered along with the 80PK-2A accuracy specification to determine the overall accuracy of the combination.

Temperature Limitations

The probe tip of the 80PK-2A has a continuous temperature rating of 927° C (1700° F). However, the opposite end of the sheath nearest the handle should not be subjected to temperatures greater than 125° C (257° F). This is the maximum temperature limitation of the handle.

Media Limitations

The sheath material of the 80PK-2A is Inconel, an alloy of chromium and nickel. It has excellent resistance to oxidation and corrosion at high temperatures, but it should not be used in the presence of sulfur above 537° C (1000° F).

OPERATION

Use the 80PK-2A as follows:

1. Use the miniature (0.312-inch pin spacing) thermocouple connector to connect the 80PK-2A to a compatible Type K temperature measuring instrument using the miniature (0.312-inch pin spacing) thermocouple connector.

2. Turn on the measuring instrument, and select the appropriate range and scale.

3. Check the readout on the measuring instrument. With no heat or cold source applied to the tip of the probe, the measuring instrument should display the ambient (room) temperature. If the instrument does not read out properly, refer to the TROUBLESHOOTING paragraphs below.

MINIMIZING THERMAL SHUNTING

The 80PK-2A Immersion Probe should be inserted at least 6.35 cm (2.5 in) into the environment to be measured to minimize the shunting effect of the sheath.

TROUBLESHOOTING

With no heat or cold applied to the probe, the measuring instrument should display the ambient temperature. If the measuring instrument does not read out properly, try the following:

1. Verify that the temperature measuring instrument is designed to be used with Type K thermocouples. The measuring instrument

should have a yellow input connector and-/or be marked "K" either on the case or in the display.

2. Check for an open circuit indicator on the measuring instrument. Some temperature measuring instruments have a built-in circuit to indicate if the connected probe is open. (All Fluke temperature measuring instruments have this feature.) Refer to the owner's manual accompanying the measuring instrument to see if this feature is available.

   Short the two input pins of the measuring instrument with a piece of wire. If the instrument is functioning, it should indicate the ambient temperature.

3. If you suspect a broken connection, use an ordinary ohmmeter to read the continuity of the probe from pin to pin. The ohmmeter should read 10 ohms or less if there is continuity.

SCALE CONVERSIONS

Use the following equation to convert °C to °F:

$$(°C \times 1.8) + 32 = °F$$

Use the following equation to convert °F to °C:

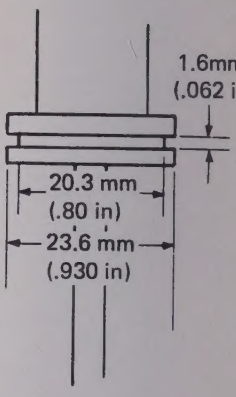
$$(°F - 32) \times 0.5556 = °C$$

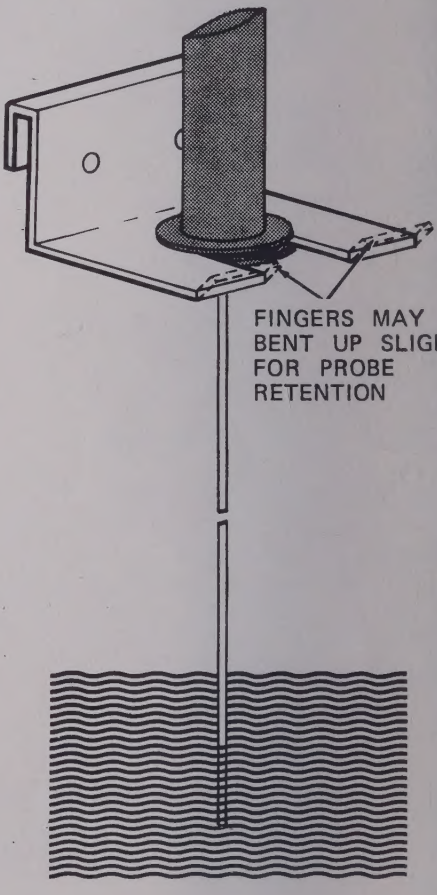
PROBE MOUNTING GROOVE

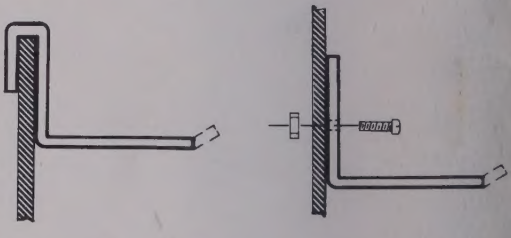
The probe finger guard contains a groove to simplify mounting the probe in a fixed position. The figure below shows nominal dimensions for the finger guard and groove, and suggests a temporary quick mounting method. However, any mounting method should be carefully designed to prevent damage to the probe or the measured medium.

CAUTION

The handle and plug of the probe are made of materials that may deteriorate when exposed to some solvents on a long-term basis.


1.6mm
(.062 in)
20.3 mm
(.80 in)
23.6 mm
(.930 in)


FINGERS MAY BE
BENT UP SLIGHTLY
FOR PROBE
RETENTION



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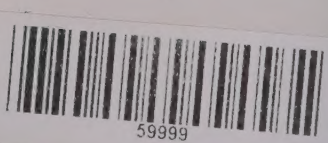

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